

COLLEGE ALGEBRA

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GPS #12

2.1 QUADRATIC FUNCTIONS: PARABOLAS II

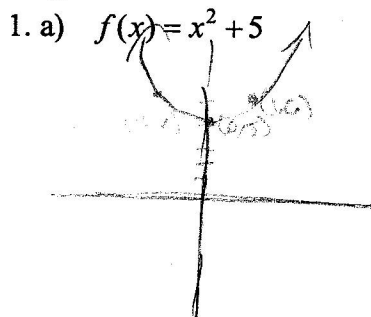
Class Time: 11:30-12:45 Date: 1-31-08

Useful Guidelines:

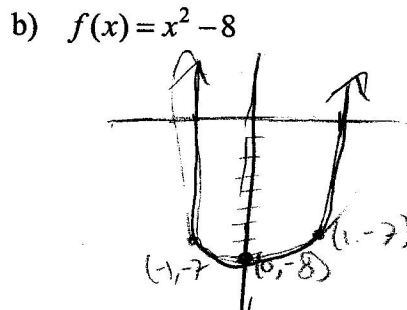
- * $f(x) = x^2 + k$: A parabola with the same shape as the graph of $f(x) = x^2$. The parabola is shifted vertically k units up if $k > 0$ or k units down if $k < 0$; Vertex: $(0, k)$.
- * $f(x) = (x - h)^2$: A parabola with the same shape as the graph of $f(x) = x^2$. The parabola is shifted horizontally h units to the right if $h > 0$ or h units to the left if $h < 0$; Vertex: $(h, 0)$.
- * $f(x) = a(x - h)^2 + k$: The parabola is open upward if $a > 0$ or open downward if $a < 0$. The axis of symmetry is $x = h$; Vertex: (h, k) .

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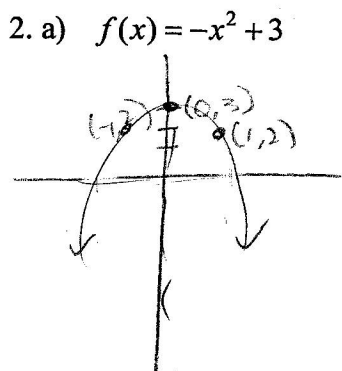
Graph each parabola. Plot at least two points in addition to the vertex. Give the vertex, axis, domain, and range.



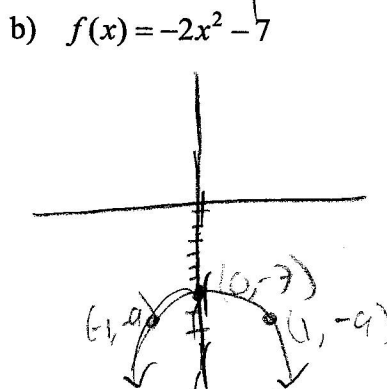
$$\begin{aligned} V &= (0, 5) \\ \text{A.O.S.} &= x = 0 \\ D &= (-\infty, \infty) \\ R &= [5, \infty) \end{aligned}$$



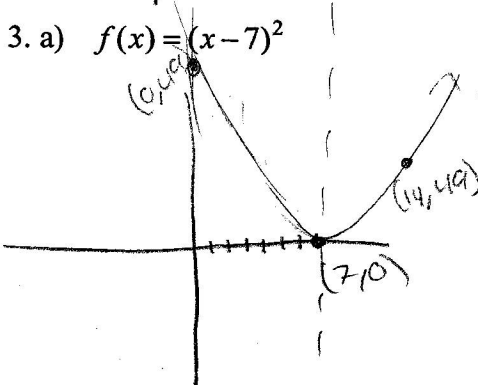
$$\begin{aligned} V &= (0, -8) \\ \text{A.O.S.} &= x = 0 \\ D &= (-\infty, \infty) \\ R &= [-8, \infty) \end{aligned}$$



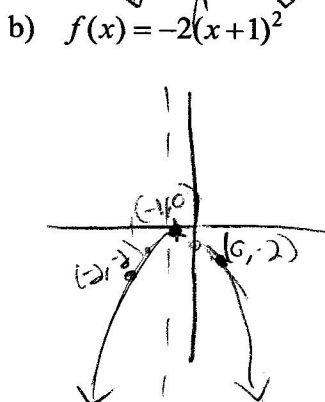
$$\begin{aligned} V &= (0, 3) \\ \text{A.O.S.} &= x = 0 \\ D &= (-\infty, \infty) \\ R &= (-\infty, 3] \end{aligned}$$



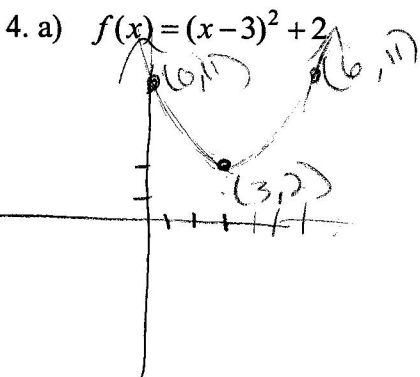
$$\begin{aligned} V &= (0, -7) \\ \text{A.O.S.} &= x = 0 \\ D &= (-\infty, \infty) \\ R &= (-\infty, -7] \end{aligned}$$



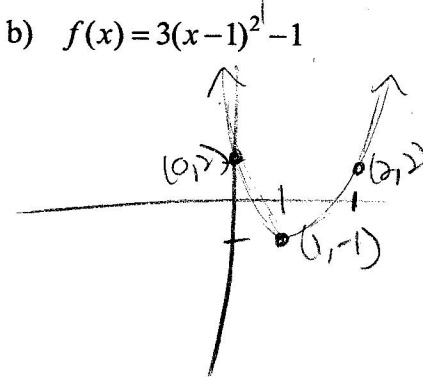
$$\begin{aligned} V &= (7, 0) \\ \text{A.O.S.} &= x = 7 \\ D &= (-\infty, \infty) \\ R &= [0, \infty) \end{aligned}$$



$$\begin{aligned} V &= (-1, 0) \\ \text{A.O.S.} &= x = -1 \\ D &= (-\infty, \infty) \\ R &= (-\infty, 0] \end{aligned}$$



$$\begin{aligned} V &= (3, 2) \\ \text{A.O.S.} &= x = 3 \\ D &= (-\infty, \infty) \\ R &= [2, \infty) \end{aligned}$$



$$\begin{aligned} V &= (1, -1) \\ \text{A.O.S.} &= x = 1 \\ D &= (-\infty, \infty) \\ R &= [-1, \infty) \end{aligned}$$